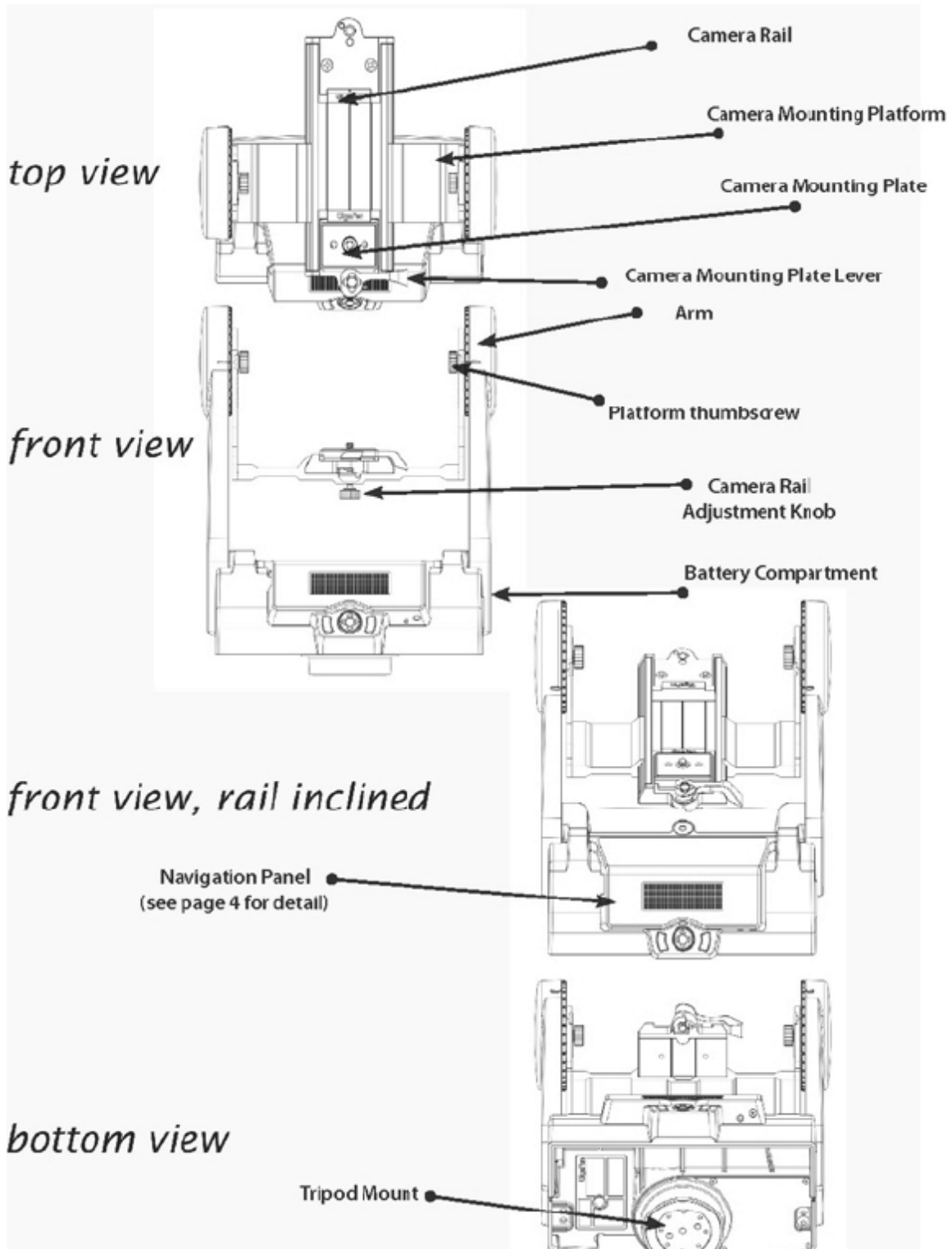


# GigaPan Manual

## GigaPan Pro Parts Overview



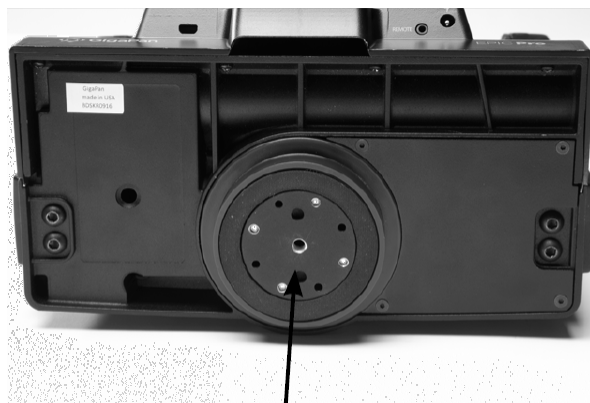
## Set Up

### Tripod

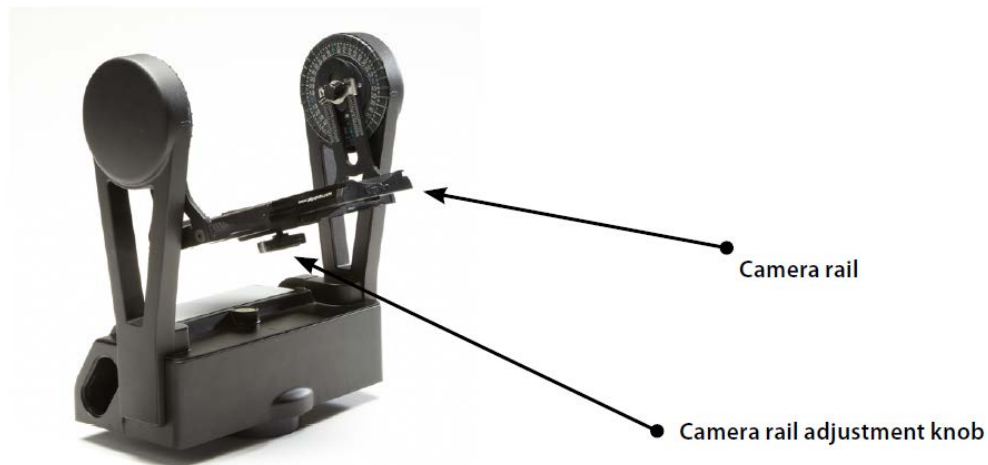
- **Pull the three legs of the tripod outward**, preferably to its limit for better stability and a better center of gravity.
- Each of the legs of the tripod can be extended at three points. **Extend the legs of the tripod to the desired height** making sure that each of the legs are extended somewhat evenly and similarly to each other.
- **Level the tripod** by approximating and extending the necessary legs in increments so that the top plate of the tripod is relatively near horizontal.

### Mounting the GigaPan

- **Take the device attachment plate off the tripod** by pushing or pulling down on the release knob located directly below the mounting plate.
- At the bottom of the GigaPan, there is a hole for the tripod mount. Align the mounting plate such that the screw lines up approximately to the hole and use the screw on the opposite end of the plate to **affix the plate onto the GigaPan**. Screw until it can no longer be turned.
- **Fit the attachment plate back onto the tripod**.
- Now using the bubble level located above the screen of the GigaPan, adjust the legs of the tripod accordingly to **level the GigaPan**.

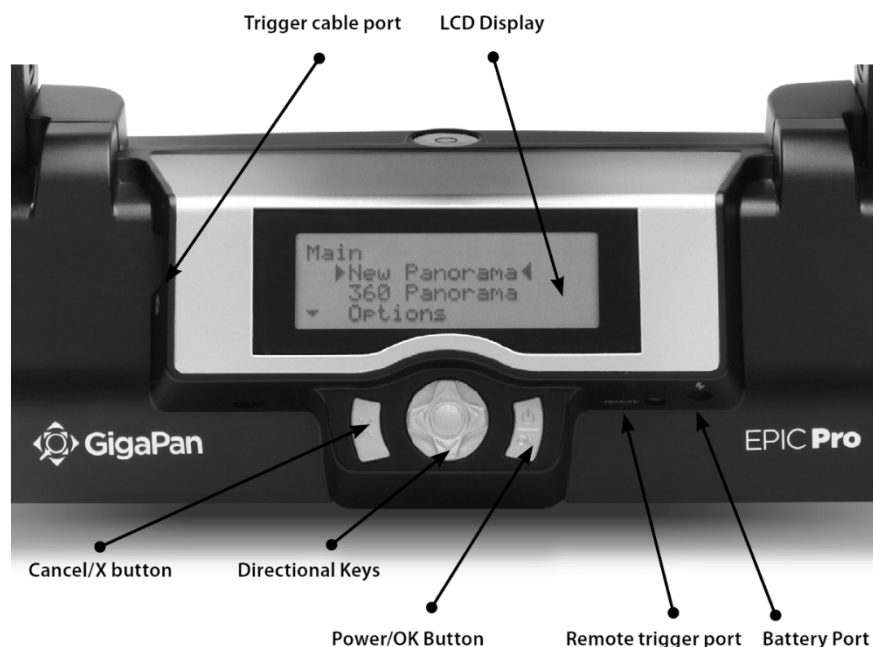


Tripod Mount

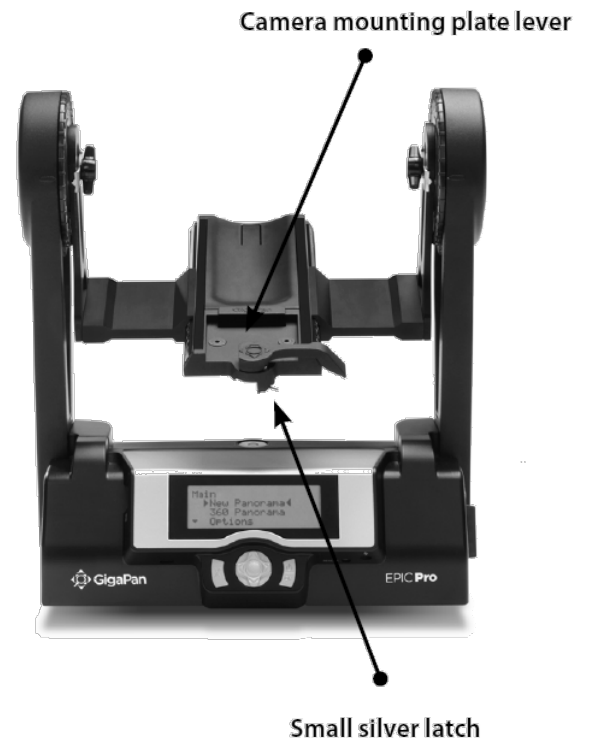


### Mounting the Camera

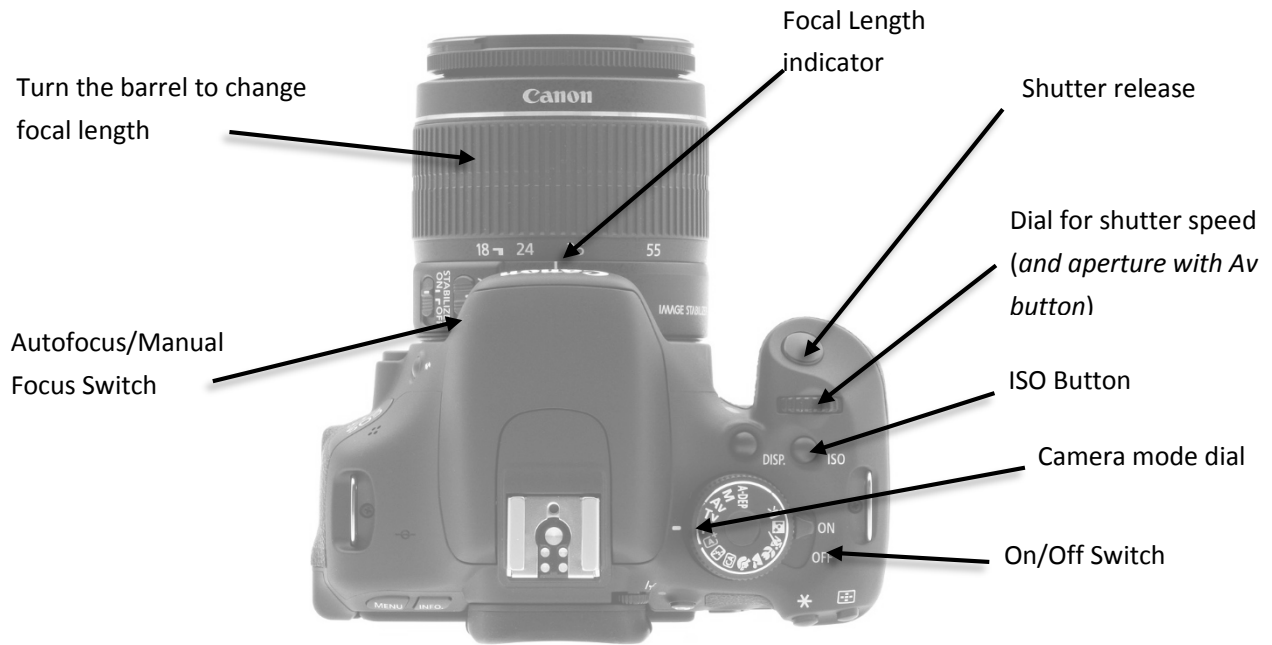
- The camera rail should usually be stored as perpendicular to the base of the GigaPan. To ensure that it has enough clearance and does not get caught into the GigaPan when rotating, use the camera rail adjustment knob to **extend the rail outwards**. Then securely fasten the knob.
- **Turn on the GigaPan** by pressing and holding the power/OK button for a few seconds.
- Use the down arrow key to find and **select the 'Move Camera' option** by pressing OK.
- Use the arrow keys to **make the camera rail horizontally level** with the base of the GigaPan. On the arms from which the rail is rotating, there are indicators of the degree of inclination. To be level, move the rail to line the arrows on the axis facing you with 0 degrees. Press OK when done.



- To **remove the camera mounting plate** from the camera rail, find the small silver pin at the front of the camera mounting plate. Turn the small silver latch clockwise and then rotate the camera mounting plate lever clockwise. Then remove the camera mounting plate.
- Similarly to mounting the GigaPan onto the tripod, we want to **mount the camera plate onto our camera**. Align the plate so that when the plate is reattached, the camera lens faces in the opposite direction of the GigaPan screen. Once securely screwed in, mount the camera plate back on the GigaPan. Be sure that the plate lever returns to the furthest counterclockwise position and **turn the small silver latch back** to its original counterclockwise position to secure the plate.

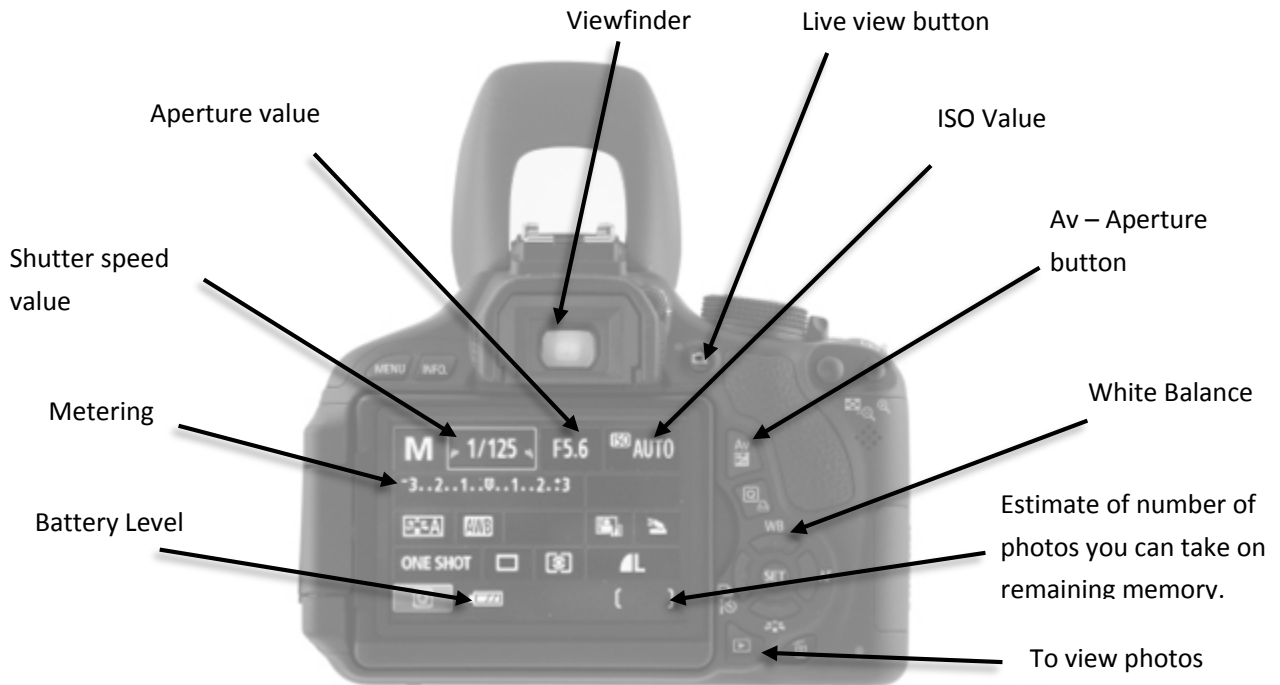


- Now **adjust the camera rail** forward or backward using the adjustment knob so that the camera and its lens's center of mass is approximately at the center of the camera rail axis. Be sure that the knob is securely fastened when done.
- This part is somewhat optional but would ensure a better accuracy when shooting the panorama. It is likely that the GigaPan is already adjusted for this. **Adjust the height of the camera rail** so that the center of the lens is approximately at the level of the platform thumbscrews attached to the GigaPan arms. Loosen the platform thumbscrews to allow for adjustment of the camera mounting plate and lens height.



### Camera Settings [Specific to the Canon T3i]

- **Turn on the camera** by switching the On/Off switch to 'On' at the top of the camera.
- **Set the desired focal length** by turning the lens at the ribbed portion. The focal length will be indicated by the white line and numbers accordingly. **To minimize distortion, avoid using a focal length less than 35mm.** Anything less than 35mm will result in an exaggeration at the edges of the lens/image which makes it harder to create a panorama. A larger number will be closer to your subject while a smaller number will be farther away from your subject. A longer focal length will require more photos than a shorter focal length for the same panorama. This focal length needs to remain constant throughout your entire panorama.
- The next settings will go through setting the camera up for a manual exposure. **Turn the camera mode dial so that it is set to 'M' for manual.** We will now go through a series of steps to find a balance in our various ways of bringing light to our camera image. Using any automatic setting can change the exposure of any side of the panorama at any point which will result in uneven lighting.
- ISO. ISO is the camera sensor's sensitivity to light or can be thought of as a creation of artificial light on the image. In broad daylight, we would prefer to minimize our ISO settings to lower values such as 100 or 200. In darker settings we may want to have a higher ISO at 800 or 1600. **Set your ISO accordingly by pressing the ISO button and pressing 'SET' to select your desired value. DO NOT use the AUTO ISO setting.**



- Aperture. The aperture value indicates how wide open the lens is. Changing this value will slowly create a larger or smaller circular opening for the lens. A higher number value will indicate that the lens is more closed, allowing less light to enter. This value also is one of the dictators of our depth of field, DOF, or how much depth can be in focus. For a panorama, we would generally want a larger DOF, so aperture values between F 4.0 to F 16 are the best range for sharp photos, with F 8.0 usually being the standard and preferred best. You may want smaller aperture values if you are indoors or with dim lighting outside. Longer focal lengths will have a shallower depth of field at the same apertures as short focal lengths, so we would want to have a higher aperture value to compensate. **Adjust the aperture accordingly by holding the Av or aperture button while turning the dial at the top of the camera.** Be sure that you see the aperture value change.
- Shutter speed. The shutter speed value is an indicator of how fast the camera shutter opens and closes to capture the image. Slower shutter speeds will leave the shutter open for longer, allowing for more light to travel to the camera sensor. This also means that with slow shutter speeds, anything moving in the shot can result in motion blur. The value specifies how many ‘seconds’ the shutter is open for. Usually values faster than 1/100s of a second (for example 1/2000 is faster and 1/10 is slower) can ensure little to no motion blur. **Adjust your shutter speed accordingly by turning the dial at the top of the camera.** Be sure that you see the shutter speed change.
- Finding light balance. **You will want to find a balance with your shutter speed, aperture, and ISO values so that you can have a good exposure.** On the camera screen, you will see a metering bar,

- which uses the camera's automatic exposure estimates to tell you whether your settings will produce an image that is too bright (will indicate on the '+' side) or that is too dark (from the '-' side). Usually, in the outdoors, you will have your desired aperture first (F 8.0 is a good aperture to start) and adjust to really fast shutter speeds and low ISO values. If you find yourself at the limit of shutter speed and/or ISO value, then you must increase your aperture value. Take a series of photos for trial and error until you get your desired exposure.
- **White Balance.** Press the up arrow key on the camera (which points to WB for white balance) and **select the appropriate white balance** for the lighting environment that you are in. Taking test shots and comparing the white balance settings can help. Do not use AUTO white balance which can result in uneven coloration in the panorama.
  - **Focus.** If you understand the logistics of using autofocus with the GigaPan, then you can consider skipping this step. Half pressing the shutter release button allows you to focus onto your subject. Either from using the live view button or looking through the viewfinder, half press the shutter release button a few times until your subject is in focus. Now **switch the autofocus switch on the lens to manual**. This ensures a consistent panorama since photos are in focus at the same depths. Be sure not to touch the lens focus ring after doing so since this may alter the focus. If this does occur, reset the switch to auto and redo this step.
  - **Connect the trigger cable to the GigaPan** and to the appropriate slot on the left side of the camera underneath the flap that has 'MIC' written on top. The camera trigger port is the one above the mic port. Be sure that the cables are securely in all the way.

### **Settings before taking the Panorama**

- While you are setting up and selecting your panorama, if at any point your screen dims or turns black, simply half press the shutter release for it to show again.
- Every time that you change lenses, camera bodies, or zoom focal length, you must perform the 'Camera setup' function in order to give the GigaPan the angle of view for your lens and camera combination. From the main menu, scroll down to **find and select 'Camera Setup'**. Setting this up is important for the GigaPan to know how many images it must take to overlap your photos.
- If you have changed the focal length or lens, **press OK to continue to set the field of view (FOV)**.
- **Follow the instructions on each subsequent screen** and press OK when you are done with each step. You can either fulfill these steps by looking through the viewfinder or pressing the live view button (the latter is easier). First look at the center of your camera and remember this unique point in your view. Press OK. The next screen prompts you to align this same point with the top of your screen or lens (if you're using the viewfinder). Use the up and down arrow keys to align that same point to the

top of your screen and press OK. Do the same to align it to the bottom of the screen and press OK. It will then display 'Field of view set'.

### **Selecting the Panorama**

- In the main menu, **select 'New Panorama'**. Since we have already set our camera's FOV and zoom, press OK.
- Visualize the extent of your desired panorama. Use the arrow keys to move up/down and left/right to **point your camera lens to the upper left of your desired image**. Press OK.
- Now use the arrow keys to **point your camera to the bottom right of your desired image**. The screen will vertically display the amount of pictures that it will take on each edge and how long it will take. If the time is too long or if it is going to take too many photos for your memory card, you need to press X to cancel and redo these settings (see Optional Settings). Otherwise, **take note of the amount of horizontal and vertical pictures**, for these will be important when stitching the photos. Also take note of the amount of pictures taken and at which file number these photos are being saved at to ensure that you select the right photos when stitching them together. Now press OK.
- This part is optional, so press X if you do not wish to see the corners of your panorama. You can now allow the GigaPan to show you the extent of your panorama by pressing OK when it asks whether to show the panorama. This will prompt the GigaPan to turn the camera to all four corners of the GigaPan for you to see on your screen if it does include what you had intended. Press OK at each corner when you are done viewing it.
- Now it will ask whether or not you want to start the panorama. **Press OK to start**. Press OK to each subsequent screen once you are sure of your settings. The GigaPan will now begin to move and trigger each photo, so be sure not to move the GigaPan in anyway and do not move in front of the camera. When it is done, it will display 'Panorama done'. Press OK to continue. You are now done with taking the panorama.

### **Taking Down the GigaPan**

- When you are ready to put away the GigaPan, begin with turning off the camera, removing the trigger cable from both devices, and then dismounting the camera. Remember to turn the silver latch clockwise before turning the mount plate lever clockwise to release the camera and mount. Unscrew the mount plate from the camera, and put the plate back onto the GigaPan. Turn the lever and then the silver latch counterclockwise to secure the plate.
- We still need the GigaPan on. From the main menu, find and select the 'Move Camera' option. Move the camera rail so that the axis arrow points to the blue arrows on the inclination. If you had altered

the height of the rail, return the rail to the lowest height. Use the camera rail knob to return the camera rail to its lowest height.

- Turn off the GigaPan by pressing and holding down the power/OK button for a few seconds.
- Dismount the GigaPan from the tripod and remove the tripod mounting plate from the GigaPan. Return the plate to the tripod.
- Reduce the legs and head of the tripod to their shortest length and push to collapse the three legs together.
- Return the GigaPan and camera to their bags.

## **Extra Useful Information**

### **GigaPan related**

#### Checking Battery Status

- With the GigaPan on, scroll to find and select 'Options' from the main menu.
- Find and select 'Battery Status'. This will display a percent value of how much is of the battery's power capacity is left. Press OK to continue.

#### Optional Settings

- Photo time length – To alter the amount of time in between the GigaPan taking the photos
  - From the main menu, scroll down and select 'Options'. Then select 'Time/Exposure'.
  - For faster times scroll up and for slower times scroll down. If you are in dim lighting where your shutter speed is slower, you may want to alter this exposure time length on the GigaPan so that it allows for enough time for your camera to fully take its photo. The fastest is at 1/50 of a second. Basically, we want the GigaPan's exposure time to be greater than our shutter speed at all times.
- Photo overlap – To alter the amount of overlap each photo has on adjacent photos
  - From the main menu, scroll down and select 'Options'. Then scroll down and select 'Expert Options'. Continue scrolling and select 'Picture Overlap'. Here you can select the amount of overlap by percentage each photo taken has with adjacent photos.
  - The people at GigaPan believe that the best amount of overlap is of about 30% or one-third. Anything less may risk capturing some of the camera lens's faults/limitations while anything greater is only disadvantageous with the increase in the number of photographs. Adjust this setting accordingly to best fit your needs.

## Tripod related

The extent of the tripod heights

- Wider stance. Besides the main legs for extending the height of the tripod, the legs of the tripod can be moved away from the tripod at a more oblique angle. With the three tripod legs fully collapsed, the silver latches at each of the three body-leg joint can be turned clockwise. Once all turned, you can fully pull each legs out to see that it will stand with a wider leg stance and lower center of gravity. Likewise, if the tripod was already set in the wide stance, you can switch it back to the standard stance by turning the silver latches counterclockwise.
- Increasing tripod head length. The head at which a device can be mounted on the tripod can be raised as you can see there is a middle pole extending from the bottom of it. There is a knob on the side of tripod at the level of the body-leg joint that can be loosened. Turn the knob, and you are now able to lift the tripod head up to a desired height. Securely fasten the knob to hold the pole in place.



## Camera related

### Charging the camera battery

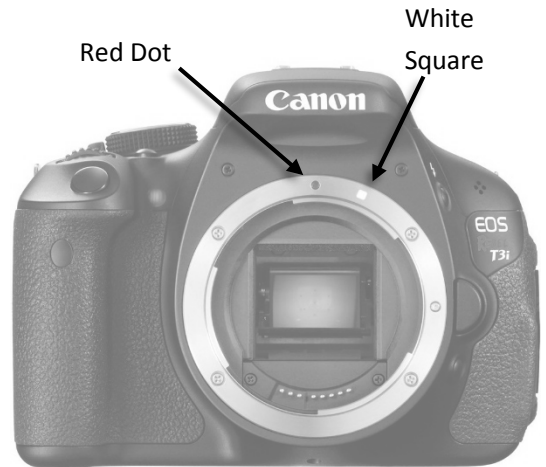
- Take the battery out of the camera by opening the battery slot at the bottom of the camera. There is an indicator where to pull down the latch where it is labeled 'BATT. OPEN' with a down arrow.
- Push the grey plastic clasp to the left to release the battery and pull it out. Slide it into its charger, lining up the slotted end with that in the charger and push it down to lock it in. There is an arrow in the direction at which you should slide it into the charger. The caution notification on the battery should face on top. Plug in the battery charger into the wall outlet.
- The battery charger will light the 'Charge' LED light red until it turns on the green LED 'Full' light. Remove the battery by lifting the exposed end up and slide it out. Open the battery port on the camera and line up the slotted edges of the battery head with those in the camera. Push the plastic clasp aside and push the battery all the way in until the clasp holds onto it. Close the lid of the battery port.



### Changing Lenses

- While doing either inserting, changing or removing a lens, we want to minimize any amount of dust/particles getting into the camera or the lens. Dust not getting into the lens is of slightly greater importance since the camera has an automatic function to kind of clean its sensor. Nonetheless, it is still important to minimize particle entry on both ends. It's best to be in a stable area while doing these steps.

- If we are starting with no lens on the camera body, start by holding down the little button next to the body cap while turning the body cap counterclockwise. If you lift up the cap, you will see a white square and red dot at the rim of the hole. For the 18-55mm, it is only important to be aware of the white square. For the 75-300mm, we should be aware of the red dot. Allow the cap to loosely remain on top of the camera body.



- There are two ends to the lens with caps. We are looking to remove the end with the ribbed edges. Hold the lens so that this end is face down and remove this cap by rotating it clockwise. Find the white square or red dot at this now opened bottom end.
- Remove the body cap from the camera and align the white square/red dot of the lens with the white square/red dot of the camera body. You will see that the lens will perfectly fit into the camera body. Now turn the lens clockwise until you hear a click, denoting that you have securely fastened the lens into the camera.
- To remove the lens, it will be the exact same thing with did with removing the body cap. To put the body cap back on, take the lens off while still holding it upright in that position so dust does not enter and put the body cap on. Then take the lens and secure its cap back on. If we are changing lenses, unfasten the current lens and quickly replace it in a similar manner to how we replaced the body cap.
- Be sure that if you are returning a cap to any part, securely fasten it back on.

*For any other specific problems or questions specifically relating to the GigaPan, refer to the full manual at:*

*<http://www.gigapan.com/cms/manual/pdf/epicpro-manual.pdf>*

## Processing Images

- The software to stitch these photos is called Stitch and is installed on only two laptops: one pc running with a core i5 processor (the newer Toshiba Toughbook) and one on a mac.
- It is not necessary to move the files onto the laptop, but it may be better to for organizational and speed purposes. Insert the SD memory card into the appropriate slot and create a folder for each panorama that you have taken. Copy each set of panorama photos into their respective folders. Refer to your notes to see where the start and end of each of your panoramas are.
- Open the Stitch program on the laptop. Click on add images and locate the folder from a specific panorama. Select all these photos and press OK.
- The default number of rows is 5, and you may see that your photos do not quite line up. From your notes, adjust the number of rows to the correct number from when you had written from the GigaPan. If you do not have this number, you may try to continually adjust the number of rows until you see it fit.
- When you have the correct settings, click on the 'Save selection and Stitch' button on the bottom right hand side of the screen. You will then be prompted to save this GigaPan as a .gigapan file by default. For organizational purposes, you may want to either create a separate folder for completed panoramas or to save this in the same folder as the individual images are in. Name the file accordingly. Press save when you are done.
- There will be a progress bar at the bottom of the screen which will show at what percent the program is done with stitching the panorama together. This time for processing can vary from a minute to several minutes depending on the computer and mostly depending on the number of photos you have taken.
- Once you are done, you can view the GigaPan at various levels of zoom. It is optional to upload this completed panorama onto gigapan.com. At the end of the progress bar, there is an 'Upload' button from which we can upload our panorama onto gigapan.com. You can also access this in the 'Upload' tab. You must add some sort of title and description. You have the option of adding 'Tags' which are much like tags on social media which will allow for Google searches to find your image based on these associated words or 'tags'. You have the option of keeping this panorama private in which only you and whoever you give the direct URL of the panorama can see (this link will be given to you). You must have a gigapan.com account to upload which is free for anyone to create one and use.

Sign in by using our department account:

Username: CPPGeology

Password: Yellowstone

Once it is done uploading, it will display the direct link to our panorama which you can share. You can explore the various options to view this panorama on this website.

- Otherwise you can also at this point click on File>Export>file-type to export this .gigapan file as another image file: as a .TIFF or as an Adobe RAW file. .TIFF files have a limit of 4 GB, so if you may be notified that your panorama may be too large to be saved as such. The Adobe RAW file can be opened in Adobe Photoshop and edited and eventually saved as a JPEG or another image file.
- To start another stitch, go to File>New GigaPan.

For a visualization of how to complete these steps, visit:

<https://www.youtube.com/watch?v=rxOC4NG0nRI>